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# Scotogenic $U(1)_{L_\mu - L_\tau}$ origin of $(g-2)_\mu$, W-mass anomaly and 95 GeV excess

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We study a scotogenic extension of the minimal gauged $L_\mu - L_\tau$ model, including three right-handed singlet fermions and a scalar doublet all odd under an in-built $Z_2$ symmetry to explain the anomalous magnetic moments of the muon, CDF-II W-mass anomaly, and the 95 GeV excess reported by the CMS collaboration. While the minimal model can successfully explain the muon $(g-2)$ and CDF-II W-mass anomalies, the required diphoton signal strength for the 95 GeV scalar, together with that of the SM Higgs, can not be obtained in the minimal model. The same can, however, be explained by incorporating two additional scalar doublets whose only role is to contribute radiatively to diphoton decay modes of the light, neutral scalars. Due to the scotogenic extension, the model remains consistent with the observed properties of light neutrinos and dark matter in the Universe.

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